

Exploring Physicians' Views and Values in Relation to Maternal Serum Screening

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Abstract

Objective: Little is known about physician support for prenatal screening. We sought a better understanding of physicians' values and opinions as they relate to prenatal screening, termination of affected pregnancies, and disability.

Methods: Surveys were sent to all family physicians/general practitioners and obstetricians in Saskatchewan during May and June 2005.

Results: Of those physicians who responded, all obstetricians and 91% of family physicians reported offering maternal serum screening (MSS) to pregnant women in their practices. Of respondents who offered MSS to their patients, 87% of obstetricians and 72% of family physicians reported offering MSS to all pregnant women. Approximately one half of respondents agreed that they had enough knowledge to counsel a pregnant woman with a fetus affected by Down syndrome or spina bifida; 40% said the same about a fetus with trisomy 18. Twenty-six percent of physicians agreed that offering MSS was in conflict with their culture, religion, or personal value systems if it led to termination of pregnancy. One third of physicians reported having concerns about the increasing capacity for genetic testing of fetuses and the social, ethical, and clinical implications of such testing.

Conclusion: Physicians held diverse views regarding prenatal screening, selective termination, and disability. Personal views and biases, in either direction, are relevant to our understanding of the clinical encounter and the ethical quandaries faced by practitioners. These value differences also may explain at least some of the variation in the use of MSS observed across the country, although the current study was not designed to make a causal link. There is a need to better understand how value differences affect the uptake of new reproductive technologies and the implications for health care policy and medical practice.

Résumé

Objectif : Nous en savons peu sur le soutien dont bénéficie le dépistage prénatal de la part des médecins. Nous avons cherché à mieux comprendre les valeurs et les opinions des médecins en ce qui a trait au dépistage prénatal, à l'interruption des grossesses affectées et à l'invalidité.

Key Words: Obstetrics and gynaecology, ethics, prenatal screening, maternal serum screening

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Méthodes : Des sondages ont été postés à tous les médecins de famille / omnipraticiens et à tous les obstétriciens de la Saskatchewan au cours des mois de mai et de juin 2005.

Résultats : Chez les répondants, tous les obstétriciens et 91 % des médecins de famille ont signalé que, dans le cadre de leur pratique, ils offraient un dépistage sérique maternel (DSM) à leurs patientes enceintes. Parmi les répondants qui offraient un DSM à leurs patientes, 87 % des obstétriciens et 72 % des médecins de famille ont signalé qu'ils offraient un DSM à toutes leurs patientes enceintes. Près de la moitié des répondants étaient d'avis qu'ils disposaient de connaissances suffisantes pour conseiller une patiente enceinte présentant un fœtus affecté par le syndrome de Down ou le spina bifida; 40 % d'entre eux partageaient le même avis en ce qui concerne les fœtus présentant une trisomie 18. Vingt-six pour cent des médecins étaient d'avis que l'offre d'un DSM entraine en conflit avec leur culture, leur religion ou leurs valeurs personnelles lorsque celui-ci menait à une interruption de grossesse. Le tiers des médecins ont signalé des préoccupations au sujet des percées dans le domaine du dépistage génétique des fœtus, ainsi qu'au sujet des implications sociales, éthiques et cliniques de ce type de dépistage.

Conclusion : Les opinions des médecins au sujet du dépistage prénatal, de l'interruption sélective et de l'invalidité sont variées. Les opinions et les biais personnels, quelle qu'en soit la nature, sont pertinents en ce qui a trait à notre compréhension de la rencontre clinique et des dilemmes éthiques auxquels font face les praticiens. Ces différences en matière de valeurs pourraient également expliquer (du moins, en partie) la variation constatée en ce qui a trait au recours au DSM d'un bout à l'autre du pays, et ce, bien que la présente étude n'ait pas été conçue pour établir un lien de causalité. Nous devons mieux comprendre la façon dont les différences en matière de valeurs affectent la mesure dans laquelle les nouvelles technologies génésiques sont utilisées, ainsi que les implications que cela comporte en matière de politique de soins de santé et de pratique médicale.

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INTRODUCTION

Use of prenatal diagnostic technology has traditionally been low in Saskatchewan compared with the rest of Canada, and MSS for prenatal diagnosis has followed this trend.^{1,2} MSS measures three serum markers in pregnant women during the second trimester and predicts a woman's likelihood of having a baby with Down syndrome, an open NTD, or trisomy 18. Data from provincial initiatives outside Saskatchewan have shown MSS use to be comparably

higher elsewhere, except for Newfoundland and Labrador.³ Between 2001 and 2006, 19% to 25% of pregnant women living in Saskatchewan opted to undergo MSS, whereas participation rates in Ontario, British Columbia, and Manitoba were two to three times higher (unpublished data, Saskatchewan Health, Provincial Laboratory, Maternal Serum Screening Program, Aug 22, 2006; personal email communication from Tianhua Huang, Ontario Multiple Marker Screening program, Mar 9, 2007; Jane Evans, Manitoba Maternal Serum Screening Committee, May 15, 2007; Andre Mattman, Department of Pathology and Laboratory Medicine, Nov 10, 2007). Use was somewhat higher in 2005 in the Maritime provinces as well (personal email communication, Kent Dooley, Chief of Pathology and Laboratory Medicine, IWK Health Centre, Aug 20, 2007). The Saskatchewan MSS program, implemented in 2001, was guided by Ontario's program model, and educational materials similar to those used in Ontario were produced and distributed to all family physicians and obstetricians. Training sessions were held throughout the province. The reasons for this variability of MSS uptake are not well known; however, possible factors include physician acceptance and support of, or comfort with, testing. Other factors such as differences in the underlying value systems of populations may also be responsible, although these conjectures are even less well studied.

Not all physicians offer MSS to their patients, and many offer testing only to women with higher risk pregnancies, contrary to recommendations made by the Society of Obstetricians and Gynaecologists of Canada and others.⁴⁻⁶ Whether or not MSS is offered has also been found to differ according to physicians' specialty and gender.^{7,8} Another factor determining physicians' support for screening may be their views on the ethics of prenatal screening and the possibility of termination of pregnancy when one or more conditions are detected. We were unable to locate any recently published research exploring physicians' views in these respects. However, two surveys commissioned by the Royal Commission on Reproductive Technologies (1993) found fairly dramatic regional differences in physicians' attitudes about prenatal diagnosis and selective termination, and, in contrast, relatively little variation in women's acceptance of prenatal diagnosis.^{1,9} Saskatchewan physicians more often opposed selective termination and had the

lowest referral rates for prenatal diagnosis. Nevertheless, little is known about the full range of potential factors contributing to physicians' support for, or opposition to, reproductive screening and testing, and the few studies done have focused on prenatal diagnosis exclusively and are now dated. Therefore a clear need exists for more recent research exploring physicians' views on prenatal screening.

It is plausible that physicians' personal views may affect how MSS is presented (or not presented) in the clinical encounter, thereby potentially affecting use. A study in the United States found that while the majority of physicians try to provide balanced information in a value-neutral manner, more than one third admitted that they tried to influence patients' decisions.¹⁰ Physicians are also members of the population they serve and their views may reflect true differences in underlying value systems if, in fact, variations in uptake are due to differences in values. For example, one evaluation involving women giving birth in Newfoundland found that while the majority of women were offered MSS by their physicians, only a small proportion opted for testing, which may point to individual preferences and values.¹¹

The current study presents data from one Canadian province on physicians' values and opinions as they relate to MSS, termination of affected pregnancies, and disability. It is not meant to draw a causal link between physicians' views, values, and MSS practice, but rather to provide a better understanding of the incongruencies between personal viewpoints and practice requirements, thereby revealing potential dilemmas faced during the clinical encounter.

METHODS

A self-report questionnaire was adapted from the work of Carroll et al.⁴ and mailed to all 833 licensed Saskatchewan family physicians/general practitioners and all 41 obstetricians in May 2005. An initial survey questionnaire and letter inviting participation were mailed out and followed two weeks later by a reminder letter encouraging participation and a second copy of the questionnaire. The eight-page questionnaire contained all of the questions from Carroll's instrument with additional questions assessing physicians' opinions regarding MSS. For the questionnaire, a list of statements was assembled in response to some of the issues raised in the literature and in response to qualitative comments published in an Ontario study.⁴ These statements touched on some of the ethical and social dilemmas raised by prenatal screening in order to better understand physicians' views and values. Respondents were asked to indicate whether they strongly agreed, agreed, were neutral, disagreed, or strongly disagreed with each statement.¹² Frequency distributions were generated for all categorical data variables. For the statistical tests of difference, responses

ABBREVIATIONS

MSS maternal serum screening

NTD neural tube defect

Table 1. Physicians' characteristics*

	Frequency (%)
Type of health care provider	
Obstetrician	16 (8)
Family physician	175 (92)
Age	
< 30 years	4 (2)
30–39 years	57 (30)
40–49 years	63 (33)
50–59 years	50 (26)
≥ 60 years	16 (8)
Physician gender	
Female	96 (50)
Male	95 (50)
Years practising as a physician	
≤ 5 years	31 (16)
6–10 years	22 (12)
11–20 years	69 (37)
> 20 years	66 (35)
Practice location	
Large city (Regina or Saskatoon)	104 (55)
Medium-size city (population 10 000–50 000)	35 (19)
Small city, town, or Northern Saskatchewan (< 10 000)	49 (26)
Proportion of all patients visiting because of a pregnancy	
Almost all	9 (5)
About one half	16 (9)
One quarter	61 (33)
One eighth or less	101 (54)
Performs deliveries	
Yes	94 (49)
No	96 (51)
Shared care or sole provider of prenatal care	
Shared care	109 (57)
Sole provider	63 (33)
Both shared care and sole provider	18 (9)
Involved in undergraduate or postgraduate child health education	84 (44)

*Missing cases omitted from frequency calculations

from the statements were collapsed into two categories: “agree or strongly agree” and “disagree or strongly disagree.” Respondents were also given space to provide additional comments, and a number of quotations were selected by the authors to elaborate further on what the quantitative findings showed. The survey was pilot tested with a small group of physicians and was modified on the basis of the feedback. Ethics approval was received from the University of Saskatchewan Behavioural Research Ethics Board.

Survey data were analyzed using SPSS, version 11.0 for Windows (SPSS Inc., Chicago IL). Frequency distributions were generated for all categorical data variables. The chi-square and Fisher exact tests were used to identify significant differences between groups.

RESULTS

Survey Response Rate

Of 334 surveys returned, a total of 191 physicians were eligible to participate (175 family physicians/general practitioners and 16 obstetricians). Ninety-one respondents were ineligible because they did not provide prenatal care, and 23 were ineligible because they had moved or retired. A further 29 physicians returned the survey incomplete without explanation. To estimate a response rate, we based our denominator on published data from the most recent National Physician Survey (2004), which showed that 57% of family physicians/general practitioners in Saskatchewan provided prenatal care. After excluding physicians who had moved or retired, the response rate for both family physicians and obstetricians was 39%.

Respondents' Characteristics

Respondents were located in all areas of the province, including the two major urban centres, smaller cities, towns, and northern communities (Table 1). The majority of obstetricians practised in Saskatoon or Regina, but family physicians were more dispersed. As expected, obstetricians had a much larger prenatal patient load than family physicians. Although 69% of obstetricians said one half or more of their patient visits were for prenatal care, 54% of family physicians saw “very few” patients for prenatal care, and only 8% said one half or more of their patient visits were for this reason. All obstetricians and 46% of family physicians offering prenatal care also conducted deliveries. The average length of time in practice was similar for family physicians and obstetricians. The geographic distribution of physicians in the sample was representative of the larger physician population in Saskatchewan, although the average age of physicians in the sample was slightly lower.^{13,14} Female family physicians and obstetricians were overrepresented in our sample, although this was expected

among family physicians because female family physicians provide prenatal care more often than their male counterparts.^{14,15}

Provision of MSS

Ninety-one percent of respondents (174/191) reported offering MSS to women in their practice. All obstetricians and 91% of family physicians offered testing (P for difference > 0.05). Female physicians were more likely than male physicians to offer MSS (99% vs. 84%, $P < 0.001$).

Of respondents providing MSS to their patients, 87% of obstetricians and 72% of family physicians reported offering MSS to all pregnant women ($P > 0.05$). Twenty-one percent of these respondents offered MSS only to women aged 35 and over; 3% of respondents who offer MSS to their patients checked the "other" category, which included responses such as "any woman who asks to be tested," "only women who indicate that termination might be chosen," and "women with a family history of Down syndrome." Six percent of respondents offering MSS to women in their practice did not answer this question.

Physicians' Opinions Regarding MSS

MSS provision and test performance

Although 73% of physicians responding offered MSS to all pregnant women, 83% of respondents agreed that the test should remain a woman's choice and should not be made routine (Table 2). Forty-five percent also agreed that the false-positive rate of MSS was too high (approximately 6% for Down syndrome, 2% for open NTDs, and less than 1% for trisomy 18), and therefore might cause unnecessary anxiety for pregnant women.¹⁶⁻²¹ When physicians were asked to provide specific feedback about MSS in the questionnaire, much of the feedback pertained to their concerns about screening low-risk populations. Representative feedback included the following:

"Only high risk patients should be offered MSS; many younger patients get quite anxious about it, usually unnecessarily."

"Perhaps changing the age offerings? In my young practice many patients are confused, especially if [their] risk is greater than average but less than the risk of spontaneous abortion during amniocentesis."

"Scrap it as a universal program. As we increase the number of young women in the group of tested people we will have more normal babies treated with anxiety due to the unacceptable false positive rates."

MSS utility

Two thirds of respondents agreed that positive MSS results are useful for pregnant women, even if they decide not to

terminate an affected pregnancy (Table 3). Obstetricians were more likely to agree with this statement than family physicians, although the association was not statistically significant ($P > 0.05$). The majority of respondents (62%) disagreed that only women who would choose termination should be offered screening, but there was some support (25%) for limiting MSS to this group. More male physicians and family physicians held the latter view ($P < 0.05$). A majority of respondents (73%) believed that testing creates anxiety for women and their families:

"MSS alone is not so useful—it's done late, and if termination is an option, it is by necessity a late one. When MSS will not result in management change, it is mostly a worry for mothers."

"Most women indicate that they do not think they would follow-up on an abnormal screen with amniocentesis, and most say they definitely wouldn't abort. But they would like the MSS for reassurance of seeing good values."

"The anxiety that [the high false-positive rate] causes cannot be reduced during the pregnancy and goes on for the child's life."

"MSS discussion dampens the natural excitement of pregnancy."

Physicians' Assessment of Their Counselling Abilities

Family physicians and obstetricians are often responsible for patient education and follow-up counselling. Accurate, unbiased information must be provided during counselling, with the goal of assisting women to make autonomous decisions. Respondents were asked to rate their agreement with statements about specific disabilities and their ability to counsel pregnant patients whose infants would have one of these disabilities.

One half of all respondents (54%) reported difficulties in explaining the limits of screening tests to their patients. Physicians were also asked to rate their ability to counsel when specific conditions were identified or when the pregnancy was at heightened risk. One half of the respondents said they had sufficient knowledge to counsel women about the implications of having children with Down syndrome or spina bifida; fewer said this for trisomy 18.

"There needs to be more education of doctors. I've seen patients who had the test, had results showing higher risk but had no pre-test counselling as to what the implications were—then they were trapped."

"Other parents with children with congenital anomalies might be in a better position to offer counselling regarding these pregnancies."

Table 2. Physicians' opinions on statements regarding MSS and test provision

Statement	Strongly agree or agree n (%)	Neutral n (%)	Strongly disagree or disagree n (%)	Female and male physicians agreeing		Obstetricians and family physicians agreeing	
				%	P	%	P
MSS is a choice to be made by pregnant women and their partners and should <i>not</i> be made a routine test for all pregnant women.	145 (83)	14 (8)	15 (9)	90, 76	0.096	93, 82	1.000
Too many <i>normal</i> pregnancies have positive MSS results.	77 (45)	38 (22)	57 (33)	54, 34	0.038	47, 45	0.369
MSS counselling is adequately reimbursed.	13 (8)	51 (31)	103 (62)	9, 6	0.770	7, 8	1.000
MSS is too time-consuming.	48 (28)	49 (28)	75 (44)	25, 31	0.213	21, 29	0.739

Table 3. Physicians' opinions on statements regarding the utility of MSS

Statement	Strongly agree or agree n (%)	Neutral n (%)	Strongly disagree or disagree n (%)	Female and male physicians agreeing		Obstetricians and family physicians agreeing	
				%	P	%	P
Positive MSS results are useful to a pregnant woman even if she decides not to terminate an affected pregnancy.	122 (71)	24 (14)	27 (16)	74, 66	0.182	100, 68	0.074
Only women who would terminate an affected pregnancy should be offered the test.	44 (25)	22 (13)	107 (62)	16, 36	0.001	0, 28	0.006
MSS causes anxiety for women and their families.	124 (73)	24 (14)	22 (13)	79, 66	0.027	93, 71	0.695

Many physicians recognized a need for additional training in this area. Fifty-one percent of respondents said they would benefit from more training in MSS counselling. Responses are shown in Table 4.

Physicians' Views on Termination of Pregnancies Affected by Congenital Anomalies

Physicians were asked to assume that positive MSS results lead to increased abortion rates, and were then asked to indicate whether the MSS test itself conflicted with their own culture, religion, or personal value systems. They were also asked to rate their comfort level in referring women confirmed to have affected pregnancies for abortion. The responses are shown in Table 5.

Physicians' Views on Disability as They Relate to Prenatal Screening

Fifty-five percent of respondents disagreed that the primary goal of MSS is to reduce the prevalence of Down syndrome at birth; however, fewer respondents (40%) said the same about NTDs. One in five respondents provided no opinion. Although most respondents believed that having a child with Down syndrome or spina bifida presents a

considerable burden for parents, more than one half of respondents believed that people with these characteristics can lead full lives and make important contributions to the community. Seventy-five percent of respondents did not agree that the existence of prenatal genetic screening implies that babies born with these conditions are unacceptable to our society. However, one third of respondents indicated that they have concerns about the increasing capacity for genetic testing of fetuses and the social, ethical, and clinical implications.

The responses are shown in Table 6.

DISCUSSION

The Saskatchewan MSS program had been in operation for approximately six years at the time of this survey, with little change in level of use over this period (increasing from 19% to 25%) (Unpublished data, Saskatchewan Health, Provincial Laboratory, Maternal Serum Screening Program. Aug 22, 2006). If the goal of counselling pregnant women about prenatal screening is to allow them to make an informed decision about whether or not to undergo screening, the lower MSS use in Saskatchewan is not necessarily of

Table 4. Physicians' opinions on statements assessing their counselling abilities

Statement	Strongly agree or agree n (%)	Neutral n (%)	Strongly disagree or disagree n (%)	Female and male physicians agreeing		Obstetricians and family physicians agreeing	
				%	<i>P</i>	%	<i>P</i>
It is difficult to explain the potential for a false-positive or a false-negative MSS result to my patients.	93 (54)	32 (18)	48 (28)	48, 60	0.260	40, 55	0.114
I have enough knowledge to explain the implications of raising a child with Down syndrome to a woman with an affected pregnancy.	86 (51)	31 (18)	52 (31)	48, 54	0.219	57, 50	0.951
I have enough knowledge to explain the implications of raising a child with spina bifida to a woman with an affected pregnancy.	84 (50)	31 (18)	54 (32)	46, 54	0.182	57, 49	0.959
I have enough knowledge about trisomy 18 to counsel a woman with an affected pregnancy.	68 (41)	37 (22)	62 (37)	40, 42	0.357	71, 38	0.081

Table 5. Physicians' opinions on statements regarding the termination of pregnancies affected by congenital anomalies

Statement	Strongly agree or agree n (%)	Neutral n (%)	Strongly disagree or disagree n (%)	Female and male physicians agreeing		Obstetricians and family physicians agreeing	
				%	<i>P</i>	%	<i>P</i>
Assuming that positive MSS results lead to increased abortion rates, MSS is in conflict with my own culture/ religion/ personal value system.	44 (26)	32 (18)	95 (54)	26, 25	0.939	21, 26	0.752
I am comfortable referring a woman with a confirmed abnormality for an abortion.	106 (60)	28 (16)	40 (23)	59, 63	0.177	93, 58	0.069

concern.²² The reasons underlying the comparatively low uptake of MSS in Saskatchewan are not known, but they probably include lack of training and support for care providers, lack of support from care providers for MSS, and women's acceptance. Our survey explored several factors that may affect these areas.

Saskatchewan physicians, like Ontario care providers in 1997,⁴ expressed concern about the high false-positive rate. Respondents were concerned about creating unnecessary anxiety in young women at relatively low risk of having an affected pregnancy, and several recommended that testing be offered only to women at higher risk. Many of the respondents recognized that they lacked sufficient knowledge to counsel women about the implications of having and raising children with these conditions. We might surmise that absent or deficient counselling could complicate women's decisions regarding affected pregnancies. Recently, the Canadian Down Syndrome Society has expressed concern about the quality of prenatal counselling and stressed the need for unbiased, balanced, and

up-to-date information about the different conditions detectable through screening.²³ Our findings may be of particular concern because physicians are responsible for all MSS-related counselling in Saskatchewan. Offering women more information about their fetus without adequate pre-test and post-test counselling might be considered substandard medical care.²⁴

Obstetricians and family physicians in our study tended to agree on most issues, although there were a few significant differences of opinion. Obstetricians were more likely to agree that MSS is useful regardless of whether or not the identification of an affected pregnancy leads to abortion. This seems to support the view that MSS can be used as a means of confirming the health of the fetus and not solely for identifying "abnormalities." More family physicians than obstetricians agreed that MSS should be offered only to women who would consider terminating affected pregnancies; this result was similar to that found by Yankowitz in 1996.²⁵ This might signify fundamental differences between the views of family physicians and obstetricians

Table 6. Physicians' opinions on statements regarding disability and the intent of prenatal screening

Statement	Strongly agree or agree n (%)	Neutral n (%)	Strongly disagree or disagree n (%)	Female and male physicians agreeing		Obstetricians and family physicians agreeing	
				%	<i>P</i>	%	<i>P</i>
The primary goal of prenatal testing should be to reduce the birth prevalence of Down syndrome.	40 (24)	35 (21)	93 (55)	14, 34	< 0.001	21, 24	1.000
The primary goal of prenatal testing should be to reduce the birth prevalence of neural tube defects, such as spina bifida and anencephaly.	65 (39)	35 (21)	66 (40)	26, 52	< 0.001	29, 40	0.531
Women with an affected pregnancy should be encouraged to consider the impact on their family.	124 (73)	42 (25)	4 (2)	63, 83	0.043	79, 72	0.329
Having a child with Down syndrome presents a considerable burden for parents.	141 (83)	18 (11)	11 (6)	82, 84	0.754	86, 83	0.268
Having a child with spina bifida presents a considerable burden for parents.	147 (86)	16 (9)	7 (4)	84, 89	0.275	86, 87	0.468
All people with Down syndrome have the potential to lead full and rewarding lives and make an important contribution to our community.	98 (58)	43 (25)	29 (17)	64, 51	0.135	50, 58	0.694
All people with spina bifida have the potential to lead full and rewarding lives and make an important contribution to our community.	102 (60)	41 (24)	26 (15)	66, 55	0.112	62, 60	0.694
My culture/ religion/ personal value system prevents me from offering this test or discussing it with pregnant women.	2 (1)	19 (11)	148 (88)	0, 2	0.216	0, 1	1.000
I have concerns about the increasing capacity for genetic testing of fetuses and the social, ethical and clinical implications.	57 (33)	38 (22)	77 (45)	37, 29	0.116	29, 34	0.758
Prenatal genetic screening implies that babies with these conditions are unacceptable to our society.	23 (14)	19 (11)	124 (75)	12, 16	0.251	8, 14	0.693

regarding the intent of prenatal screening. It is important to recognize that while an estimated 90% of pregnancies in which Down syndrome is diagnosed are terminated, the decision to accept MSS does not by itself correlate with the decision to terminate an affected pregnancy.^{26,27} MSS can also be used to prepare families for the birth of a child with a disability. Nonetheless, it is the potential link between MSS and pregnancy termination that is ethically contentious and that may colour the views of care providers on the use of reproductive screening technologies. In our survey, obstetricians were more comfortable than family physicians referring women with affected pregnancies for abortion.

In a survey of care providers evaluating the Ontario MSS program, ethical concerns were most commonly raised by midwives (23%) and family physicians (9%), but few obstetricians noted such concerns (1%).⁴ Similarly, the 1992

Royal Commission on New Reproductive Technologies found that general practitioners were more strongly opposed than obstetricians to genetic testing for the purpose of preventing birth.¹ In our survey, obstetricians and family physicians showed similar levels of concern about salient ethical issues. The opinions of midwives in Saskatchewan could not be sampled, because midwifery is only now becoming formally regulated in this province. We found that a higher proportion of female physicians were concerned about the ethical, social, and clinical implications of prenatal genetic testing than their male counterparts. Since midwifery care is predominantly provided by females, our findings suggest that midwives would express more ethical concerns than physicians overall.

As in two other Canadian surveys, female physicians in our survey were significantly more likely than male physicians to

offer MSS and to offer it to all pregnant women.^{8,28} In our survey, female physicians appeared to hold different views on several issues relating to prenatal screening. For example, more female than male respondents felt that the false-positive rate was too high, while male respondents were more likely to agree that only women who would consider abortion should be offered testing. When asked about the goals of MSS, male physicians were at least twice as likely as females to agree that the goals should be to reduce the birth prevalence of Down syndrome and NTDs.

After controlling for other relevant factors, Renaud et al. found that the province of practice was an independent predictor of support by physicians for prenatal diagnosis and selective termination, and as a result postulated the existence of distinct provincial cultures.¹ Saskatchewan's continued low uptake of prenatal screening technologies relative to other provinces seems to support this hypothesis.

Our findings may not be generalizable because of the low survey response rate. The study sample may not accurately reflect the views and practices of all physicians offering prenatal care in Saskatchewan. Many physicians not responding likely did not provide prenatal care, and it is possible that many physicians provide prenatal services on an intermittent and infrequent basis, therefore being less likely to view the survey as relevant. Nonetheless, our response rate was comparable to the 34% response rate achieved in Saskatchewan for the 2004 National Physician Survey.²⁹ Small numbers may have also increased the risk of Type II error, so that significant associations between obstetricians and family physicians may have been missed because of low statistical power. Data were missing for approximately 10% of respondents for the statements reported in Tables 2–6, but no significant differences were found in terms of age, gender, or physician type (data not shown). However, those not responding to these questions were significantly more likely to say they do not offer MSS to their patients, which may have led to an underestimate of the level of concern that some physicians hold with regard to prenatal screening.

Additional questions could have provided important corroborating information. For example, we could have asked whether physicians actively encouraged or discouraged MSS. Yankowitz found that obstetricians in the United States were more likely to recommend screening than family physicians, who more often discouraged testing.²⁵ Simply offering MSS does not necessarily tell us whether the test is actively encouraged.

CONCLUSION

The findings of this study suggest that there is considerable disagreement and uncertainty among physicians regarding the primary purpose of prenatal screening, its provision,

and its likely effects. Prenatal screening technology is expanding quickly to include more tests with better predictive capabilities. Before such innovations can be seen as social progress, it will be important to gain a better understanding of the ethical issues inherent in prenatal testing in general. To our knowledge, this study is the first province-specific attempt to begin deliberately engaging physicians on these very important issues. We encourage more research in this area. While most physicians seem to be aware of the salient moral dilemmas, there remains an apparent commitment to providing prenatal screening as recommended by the Society of Obstetricians and Gynecologists of Canada and others. Such recommendations quickly become standards and subsequently routine medical practices, sidestepping the underlying moral uncertainties and warranted social debate.

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